REMARKS

Applicants are amending their claims in order to further define various aspects of the present invention. Specifically, Applicants are amending claim 1 to incorporate therein the subject matter of claim 13 (that is, to recite that the electroconductive ultrafine powder is acicular, having a minor axis in the range of 5 nm to 70 nm), and to delete recitation that the insulating film is "fired or sintered". In light of amendments to claim 1, claims 13 and 16 have been cancelled without prejudice or disclaimer.

Moreover, Applicants are adding new claims 17 and 18 to the application. Claims 17 and 18, dependent respectively on claims 1 and 17, respectively recites that the insulating film is a metal oxide having insulating properties, with a dielectric constant of at least 20, and recites that the dielectric constant is at least 100. Note, for example, the paragraph bridging pages 7 and 8 of Applicants' specification.

The rejection of claim 1 under the first paragraph of 35 USC 112, as failing to comply with the written description requirement, set forth in the last paragraph on page 2 of the Office Action mailed March 11, 2008, is noted. The basis for this rejection is the allegation by the Examiner that the recitation of "fired or sintered" insulation film does not find literal support in the specification. Applicants have amended their claims in order to delete recitation that the insulating film is a "fired or sintered" insulating film. Clearly, Applicants' original disclosure describes "an insulating film" on the electroconductive ultrafine powder. See, for example, pages 6-8 of Applicants' specification. In view of amendments to claim 1, it is respectfully submitted that the rejection thereof under the first paragraph of 35 USC 112 is moot.

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Applicants respectfully submit that all of the claims presented for consideration by the Examiner on the merits patentably distinguishes over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed March 11, 2008, that is, the International (PCT) Patent Application Publications to Nonninger, et al., No. WO 00/14017, and to Ito, et al., No. WO 02/22757, U.S. Patent No. 6,908,574 to Inamura, et al., "US Patent 6,553,966" which the Examiner characterizes as being issued to Nonninger, et al., but which is in fact issued to Cornell, et al., as correctly indicated on the Form PTO-892 enclosed with the Office Action mailed March 11, 2008, and what the Examiner characterizes as "Shibuta et al. (US 5,908,585)", under the provisions of 35 USC 102 and 35 USC 103.

Initially, the Examiner's attention is respectfully directed to reference to the U.S. patent to Nonninger, et al., "US 6,553,966". It is respectfully submitted that the patent number naming Nonninger, et al., in the "DETAILED ACTION" of the Office Action mailed March 11, 2008, is inconsistent with the name for U.S. Patent No. 6,553,966 on the Form PTO-892 enclosed with the Office Action mailed March 11, 2008; and, in fact, it is respectfully submitted that the above-referenced number (USP 6,553,966) matches the name for the U.S. patent as on the Form PTO-892. Moreover, it is noted that U.S. Patent No. 6,553,966 to Cornell, et al. is directed to a method of presetting an internal combustion engine, and it is respectfully submitted that this patent is not relevant to the subject matter of the above-identified application. Reconsideration of U.S. Patent No. 6,553,966 is respectfully requested.

As a suggestion, it is noted that U.S. Patent No. 6,533,966, issued March 18, 2003, is based upon PCT No. PCT/EP99/06498, and references PCT Publication

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No. WO 00/14017. It would appear that U.S. Patent No. 6,533,966 should be cited by the Examiner. In any event, as the Examiner has not cited U.S. Patent No. 6,533,966, if such patent is the appropriate U.S. patent being applied it is respectfully submitted that the Examiner must apply such U.S. patent, in a non-final rejection (that is a new reference being applied), if the Examiner maintains a prior art rejection with such new reference.

The Examiner's attention is also directed to U.S. Patent No. 5,908,585, characterized by the Examiner as a U.S. patent of Shibuta, et al. Upon a review of the above-identified application, it appears that there has not been any official citation of U.S. Patent No. 5,908,585, either on a Form PTO-892 or in an Information Disclosure Statement. Indication of consideration of this reference on a Form PTO-892, upon further examination of the above-identified application, is respectfully requested.

In connection with the prior art rejections, it is noted that the subject matter of claim 13 has been incorporated into claim 1. Moreover, it is further noted that claim 13 was rejected only under 35 USC 103(a), "as being unpatentable over either Nonninger et al (1) (WO 00/14017) or Nonninger et al (2) (US 6,553,966) in view of Inamura et al (US 6,908,574)". In view of amendments to the present claims, it is respectfully submitted that, clearly, all prior art rejections other than that set forth in Item 4 on pages 6 and 7 of the Office Action mailed March 11, 2008, is moot.

In connection with this rejection as set forth in Item 4, and insofar as this rejection is understood by the undersigned (noting reference by the Examiner to "US 6,553,966"), it is respectfully submitted that the references as applied by the Examiner would have neither disclosed nor would have suggested such an insulated ultrafine powder as in the present claims, having the recited electroconductive

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ultrafine powder of form (acicular) and dimensions as in claim 1, and of a material as recited therein and with an insulating film on the electroconductive ultrafine powder. See claim 1.

As will be discussed in more detail infra, it is respectfully submitted that the teachings of the applied references do not disclose, nor would have suggested, structure as in the present claims, including the recited insulating film, and advantages due thereto. It is respectfully submitted that the applied references disclose electroconductive particles, and in fact would have taught away from the insulated ultrafine powder, having the insulating film on the electroconductive ultrafine powder, as in the present claims, and advantages achieved due thereto.

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such insulated ultrafine powder as in the present claims, having features as discussed previously in connection with claim 1, and, additionally, wherein the insulating film has a relative dielectric constant of at least 20 (see claims 2 and 17); and/or wherein the insulating film includes at least one species selected from a group consisting of an oxide having insulating properties and a nitride having insulating properties (see claim 3); and/or wherein the insulating film has a thickness as in claim 5; and/or wherein the ultrafine powder is made of stannic oxide doped with antimony (see claim 12); and/or wherein the acicular powder has an aspect ratio of 2-100 (see claim 14), more specifically an aspect ratio of 10-40 (see claim 15); and/or wherein the insulating film is formed of a metal oxide (see claims 17 and 18), with a dielectric constant thereof being at least 100 (see claim 18).

The present invention is directed to insulated ultrafine powder, well suited to the formation of an IC package, a module substrate, and an electronic part

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integrated with a high dielectric constant layer, particularly well suited to formation of an inner layer capacitor layer of a multi-layer system wiring substrate and also useful for miniaturizing built-in antennas and electro-magnetic absorption sheets, units and panels which prevent electronic wave interference.

There has been proposed, as a high dielectric constant layer on a wiring substrate for removing high frequency noise, a resin composite material incorporated with at least 65 vol% of a ferroelectric material such as barium titanate as a high dielectric constant filler, preferably forming a continuous layer of the high dielectric constant filler inside the composite material. This proposed composite has a relatively large amount of ferroelectric material, the reason for the necessity of such a large amount being set forth in the first paragraph on page 3 of Applicants' specification. However, with a composite containing such a large amount of ferroelectric material filler, processability and moldability are impaired.

Against this background, and as a result of extensive research and investigation made by the present inventors on formation of a continuous layer of a filler in a resin material, the present inventors have found that objectives of the present invention are achieved through use of an insulated ultrafine powder as in the present claims, having an insulating film on the electroconductive ultrafine powder, the electroconductive ultrafine powder having a shape and dimension as in the present claims, and wherein, e.g., such powder is made of a material selected from the group consisting of stannic oxide doped with antimony, indium trioxide doped with tin, zinc oxide doped with aluminum or gallium, and barium plumbate. Through use of materials for the electroconductive ultrafine powder as in the present claims, diffusion of metallic atoms from the ultrafine powder into media of an insulant, thereby lowering the insulating properties of the resin composite material formed

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using the ultrafine powder, can be avoided. Moreover, particularly desirable is stannic oxide doped with antimony, from the aspect of manufacturing cost. Note the sole full paragraph on page 5 of Applicants' specification.

Furthermore, by utilizing electroconductive ultrafine powder in the form as in the present claims, having a minor axis in a range of 5-70 nm, deteriorated electroconductivity due to quantum size effect can be avoided, while a failure in forming a continuous layer, where relatively small amounts of powder is included in the resin composite material, can be avoided. Note the paragraph bridging pages 5 and 6 of Applicants' specification.

In addition, through utilizing powder in an acicular form, less amount of power need be added to the resin composite material in order to form a continuous layer. Note the paragraph bridging pages 5 and 6 of Applicants' specification.

Furthermore, through use of an insulating film having a thickness as in various of the present claims, a desired insulating effect is achieved, without having an adverse effect on the dielectric constant of the resin composite material formed utilizing such powder. See pages 6 and 7 of Applicants' specification.

It is emphasized that according to the present invention, an insulated ultrafine powder is provided, having an insulating film on the electroconductive ultrafine powder. As can be appreciated, the insulating nature of the powder is achieved through use of the insulating film. In this regard, compare Example 1 with Comparative Example 1, described respectively on pages 11-13, and on page 15, of Applicants' specification, the results of this respective Example and Comparative Example being shown in Table 1 on page 18 of Applicants' specification.

In lines 3 and 4 of Item 1 on page 4 of the Office Action mailed March 11, 2008, the Examiner indicates that U.S. Patent No. 6,553,966 issued to Nonninger, et

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al. "is being used as English Translation" of No. WO 00/14017. However, in the following reference is made to U.S. Patent No. 6,533,966 to Nonninger, et al., as U.S. Patent No. 6,553,966 is a U.S Patent naming Cornell, et al. as inventor.

In any event, No. 6,533,966 discloses a method of preparing suspensions and powders based on indium tin oxide, characterized in that (a) indium tin oxide precursors are precipitated from solutions from indium compounds and tin compounds in one or more solvents in the presence of one or more surface-modifying components; (b) the solvent is removed from the resulting powder, which is then calcined; (c) one or more surface-modifying components and one or more solvents are added; (d) the resulting mixture is subjected to a comminuting or dispersing treatment, with formation of a suspension; and (e) any liquid components are separated from the suspension, to give a powder. See, e.g., from column 3, line 63, to column 4, line 12. See also column 4, lines 64-67, indicating that the indium tin oxide precursors are precipitated from solutions of indium compounds and tin compounds in the presence of one or more surface-modifying components comprising one or more solvents. Note also from column 12, lines 15-53, for uses of the described indium tin oxide materials.

It is respectfully submitted that either of No. WO 00/14017 or U.S. Patent No. 6,553,966 would have disclosed or would have suggested such insulated ultrafine powder, having the insulating film, as in the present claims.

The contention by the Examiner in Items 1 and 2 on pages 4 and 5 of the Office Action mailed March 11, 2008, that the formation of an overcoat of insulating surface oxide over the conductive ITO nanoparticles of the references, upon calcination at elevated temperature, is anticipated "due to the dehydration/removal of water from the hydroxide", is respectfully traversed. Rather than having an insulating

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film, it is respectfully submitted that dehydration provides an oxide having enhanced electrical conductivity, as discussed, for example, in column 5, lines 51-56, of Inamura, et al., discussed further infra. That is, as described in column 5 of Inamura, et al., tin-containing indium hydroxide is fired so that it undergoes dehydrative decomposition and sintering to yield acicular or tabular oxide grains that maintain the shape anisotropy of aforementioned hydroxide particles. This patent goes on to disclose that as a result of this firing step, "oxygen deficiencies are introduced to produce an oxide having enhanced electrical conductivity". As seen in Inamura, et al., and contrary to the conclusion by the Examiner, it is respectfully submitted that each of Nonninger, et al. (No. WO 00/14017), and U.S. Patent No. 6,533,966 to Nonninger, et al. would have neither disclosed nor would have suggested, and in fact would have taught away from, the insulated ultrafine powder as in the present claims, including the insulating film.

It is respectfully submitted that the additional teachings of Inamura, et al. would not have rectified the deficiencies of either of No. WO 00/14017 or U.S. Patent No. 6,533,966, such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Inamura, et al. discloses Sn-containing In oxides, in the form of needles or plates that have a major axis of 0.2 μm or less and a minor axis of 0.1 μm or less, this patent also disclosing a transparent conductive film-forming indium-tin oxide powder comprising at least acicular particles and granular particles. See column 3, lines 31-33, and column 4, lines 4-6. Note also column 4, lines 11-17, describing dimensions of the acicular and granular particles. Note also column 5, lines 51-56, disclosing formation of particles having enhanced electrical conductivity by firing Sn-containing In hydroxide; and note also column 6, lines 21-27.

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It is emphasized that Inamura, et al. discloses firing the particles with the Sn-containing In hydroxide to undergo dehydrative decomposition and sintering to yield particles having enhanced electrical conductivity. It is respectfully submitted that the teachings of Inamura, et al., together with the teachings of No. WO 00/140147 or U.S. Patent No. 6,533,966, would have taught away from the present invention, including the insulating film on the specified electroconductive particles, and advantages achieved thereby.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims being considered on the merits in the above-identified application, are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Kindly charge any shortage of fees due in connection with the filing of this paper, including any extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (case 396.43509X00), and please credit any overpayments to such Deposit Account.

Respectfully submitted,

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